

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization  
International Bureau



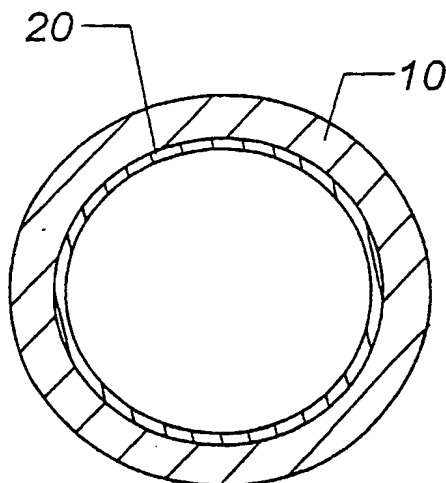
(43) International Publication Date  
18 December 2003 (18.12.2003)

PCT

(10) International Publication Number  
**WO 03/104510 A1**

- (51) International Patent Classification<sup>7</sup>: C22F 1/18, G21C 3/07, 3/20, 21/02
- (21) International Application Number: PCT/SE03/00920
- (22) International Filing Date: 4 June 2003 (04.06.2003)
- (25) Filing Language: Swedish
- (26) Publication Language: English
- (30) Priority Data:  
0201744-0 7 June 2002 (07.06.2002) SE
- (71) Applicant (for all designated States except US): WEST-INGHOUSE ATOM AB [SE/SE]; S-721 63 Västerås (SE).
- (72) Inventors; and
- (75) Inventors/Applicants (for US only): DAHLBÄCK, Mats [SE/SE]; Mangelgatan 13, S-724 76 Västerås (SE). LIMBÄCK, Magnus [SE/SE]; Släggargatan 16, S-723 37 Västerås (SE).
- (74) Agents: BERGLUND, Stefan et al.; Bjerkéns Patentbyrå KB, Östermalmsg. 58, S-114 50 Stockholm (SE).
- (81) Designated States (national): AE, AG, AL, AM, AT (utility model), AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ (utility model), CZ, DE (utility model), DE, DK (utility model), DK, DM, DZ, EC, EE (utility model), EE, ES, FI (utility model), FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK (utility model), SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZM, ZW.
- (84) Designated States (regional): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).
- Published:  
— with international search report
- For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: METHOD, USE AND DEVICE CONCERNING CLADDING TUBES FOR NUCLEAR FUEL AND A FUEL ASSEMBLY FOR A NUCLEAR BOILING WATER REACTOR



(57) Abstract: The invention concerns a method of producing a cladding tube for nuclear fuel for a nuclear boiling water reactor. According to the method, a tube is formed which comprises an outer cylindrical component (10) mainly containing zirconium and an inner cylindrical component (20) metallurgically bonded to the outer component (10), wherein also the inner component (20) at least mainly contains zirconium. The inner component (20) has a lower recrystallization temperature than the outer component (10). The cladding tube is final annealed at a temperature and during a time such that the inner component (20) substantially completely recrystallizes and such that the outer component (10) partly recrystallizes but to a lower extent than the inner component (20). The invention also concerns a cladding tube, a fuel assembly for a boiling water reactor as well as the use of a cladding tube.

WO 03/104510 A1